

Cryptodaphne kilburni, a New Species of Bathyal Turrid (Gastropoda: Prosobranchia) from the Gulf of Aden (Northwestern Indian Ocean)

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INTRODUCTION

In September 1992 a series of dredgings was performed in the southern Red Sea and Gulf of Aden by the French research vessel *Marion Dufresne* in order to contribute to the knowledge of the bathyal thanatocoenoses and biocenosis of that area. Among the abundant material of pelagic mollusks (thecosomate pteropods and heteropods) numerous empty shells of a distinctive turrid species were found. This species has conchological characters similar to those of the early Miocene *Cryptodaphne pseudodrillia* Powell, 1942, from New Zealand, type species of *Cryptodaphne* Powell, 1942, a genus comprising species usually occurring at upper bathyal depths and reported from the Indo-Pacific area. The species from Aden differs distinctly from all its previously described congeners and is accordingly here proposed as *Cryptodaphne kilburni*, sp. nov.

Abbreviations used in the text are: a/l = ratio of aperture length to total shell length; b/l = ratio of shell breadth to total length; MZB = Museo di Zoologia dell'Università di Bologna; NM = Natal Museum, Pietermaritzburg.

SYSTEMATIC DESCRIPTION

Family TURRIDAE H. & A. Adams, 1853

Subfamily RAPHIOMINAE Bellardi, 1875

Genus *Cryptodaphne* Powell, 1942

Type species by original designation:
Cryptodaphne pseudodrillia Powell, 1942

Description: Shell small to medium-sized (5.1–18.5 mm in length), claviform or biconic, with high, sometimes pagodiform, spire and excavated last whorl forming relatively short to moderately long neck. Sutural ramp wide, remaining part of whorl bearing spiral cords or keels. Axial folds typically absent, reduced to vestigial nodes on

periphery of early whorls, or relatively developed and extending from periphery to lower suture on spire whorls (in potential subgenus *Acamptodaphne*). Whorl surface covered by numerous collabral threads (particularly evident on the sutural ramp). Anal sinus reversed L-shaped. Protoconch multispiral with decussately sculptured whorls.

Included species: The type species (Early Miocene of New Zealand); *Cryptodaphne kilburni*, sp. nov. (Gulf of Aden); *Cryptodaphne rugosa* Sysoev, 1997 (Indonesia); *Cosmasyrinx semilirata* Powell, 1942 (Upper Oligocene of New Zealand); *Pleurotomella affinis* Schepman, 1913 (Ceram Sea, Indonesia); *Pleurotomella biconica* Schepman, 1913 (near Waigeu Island, Indonesia) and *Pleurotomella gradata* Schepman, 1913 (Halmahera Sea, Indonesia).

Discussion: Powell (1942) introduced *Cryptodaphne* for *Cryptodaphne pseudodrillia* Powell, 1942, from the Early Miocene (Otaian) of Kaipara, New Zealand. The same author (Powell, 1966) subsequently recognized four Recent Indonesian species as members of the genus. However, one of the species listed by Powell (1966), *Pleurotomella abbreviata* Schepman, 1913, does not belong to *Cryptodaphne* (Morassi & Bonfitto, submitted). Shuto (1971) proposed *Acamptodaphne* Shuto, 1971, as a monotypic subgenus for *Pleurotomella biconica* Schepman, 1913. That species has axial ornamentation on all teleoconch whorls (but fading below periphery on the last whorl) and a deep, narrow anal sinus differing in shape from that of *Cryptodaphne pseudodrillia*. Beu & Maxwell (1990) transferred the Upper Oligocene New Zealand *Cosmasyrinx semilirata* Powell, 1942, to *Cryptodaphne* on the basis of the protoconch sculpture. More recently, Sysoev (1996, 1997) reported *Cryptodaphne gradata* (Schepman, 1913) from the Gulf of Aden and described *Cryptodaphne rugosa* Sysoev, 1997, from Indonesia.

The specimen figured by Sysoev (1996) as *Crypto-*

daphne gradata has axial folds on early whorls, a feature not reported in the descriptions provided by Schepman (1913) and Shuto (1971). If this identification is correct then the occurrence and relative development of axial folds is a feature variable within the same species and need not necessarily represent a character valid in supraspecific segregation. Axial sculpture confined to spire whorls also occurs in *Cosmasyrinx semilirata* (see Powell, 1942).

Schepman (1913) reported *P. biconica* from a bottom of "coarse sand" while *P. affinis*, which is a typical *Cryptodaphne* species, was found on "blue mud." The presence of axial sculpture may simply represent an adaptation against predation by molluscivorous crabs on a sand bottom.

Acamptodaphne should perhaps be retained for those *Cryptodaphne* species, including *P. biconica*, *P. gradata*, and *C. semilirata*, which possess a deep, narrow anal sinus with the lower arm far extending forwardly. In *C. pseudodrillia*, as well as in *C. kilburni*, sp. nov., the sinus is moderately deep and broadly reversed L-shaped.

However, the morphological limits of *Acamptodaphne* need to be redefined and in the absence of additional material we refrain from making a final judgement on the status of this taxon.

Members of *Cryptodaphne* are characterized by spirally keeled whorls and sinuous axial threads giving the shell a somewhat "tomopleurid" appearance. These features, as well as the microscopic granules reported in most species (but most probably normal for the genus), are usually encountered in the subfamily Clathurellinae H. & A. Adams, 1858. Among the "tomopleurid" group of genera, *Cryptodaphne* most resembles the widely distributed Eocene to Recent *Microdrillia* Casey, 1903, but the diagonally decussate protoconch occurring in the former genus clearly indicates a different subfamilial allocation.

The specimen of *Pleurotomella* sp. from the Pliocene of Tuscany figured by Chirli (1997:39–40, pl. 11, fig. 1–2) is almost certainly a *Cryptodaphne*. Similarly, from the photograph of the holotype provided by Bouchet & Warén (1980:37), it would seem that the Recent *Pleurotoma anceyi* Dautzenberg & Fischer, 1897, from the Azores closely resembles *Cryptodaphne* and may prove to be an Atlantic member of the genus.

Cryptodaphne kilburni Morassi & Bonfitto,
sp. nov.

(Figures 1–7)

Description: Shell small, thin but solid, biconic-claviform (b/l 0.33–0.39; a/l 0.41–0.46) with high spire and broadly excavated last whorl with relatively short neck. Teleoconch of up to 5.5 whorls separated by deep suture. Whorls with wide and shallowly concave sutural ramp occupying slightly more than half of whorl height; remaining part of whorl gently convex and sculptured by

narrow cords. First teleoconch whorl with subsutural cord, weakly projecting peripheral keel well below middle and one cord on either side of it. On subsequent whorls peripheral keel lying at one-third of whorl height and 1–2 cords occurring below it increasing to 3–4 on last whorl. Last whorl with 12–14 cords on base and neck, relatively uniform in strength and well spaced, lacking interstitial threads. In some specimens feeble spiral threads present on sutural ramp. Axial sculpture consisting of numerous sinuous collabral threads particularly evident on sutural ramp. Under SEM (Figure 6), entire whorl surface seen to be covered by rows of granules rendering somewhat crisp axial threads on sutural ramp. Aperture narrowly pyriform, acute posteriorly; columella almost straight; parietal region weakly convex. Inner lip thinly callused; fasciole absent. Siphonal canal short, wide and shallowly notched. Outer lip rather thin, smooth within, lacking labral varix. Anal sinus (Figure 7) moderately deep, broadly reversed L-shaped, with its apex below middle of sutural ramp.

Protoconch tall and narrowly conical of 3.25 decussately sculptured whorls. Color of teleoconch yellowish-white; protoconch reddish-brown.

Dimensions: Holotype 6.5 × 2.3 mm, aperture height 2.7 mm; largest paratype: 6.7 × 2.2 mm, aperture height 2.7 mm; smallest paratype: 5.1 × 2 mm, aperture height 2.3 mm.

Type locality: Gulf of Aden, station RS 92/1.

Station	Co-ordinates	Depth	No. specimens
RS92/1	From 11°55'95"N–44°22'70"E	810 m	18
	To 11°55'82"N–44°22'53"E	795 m	

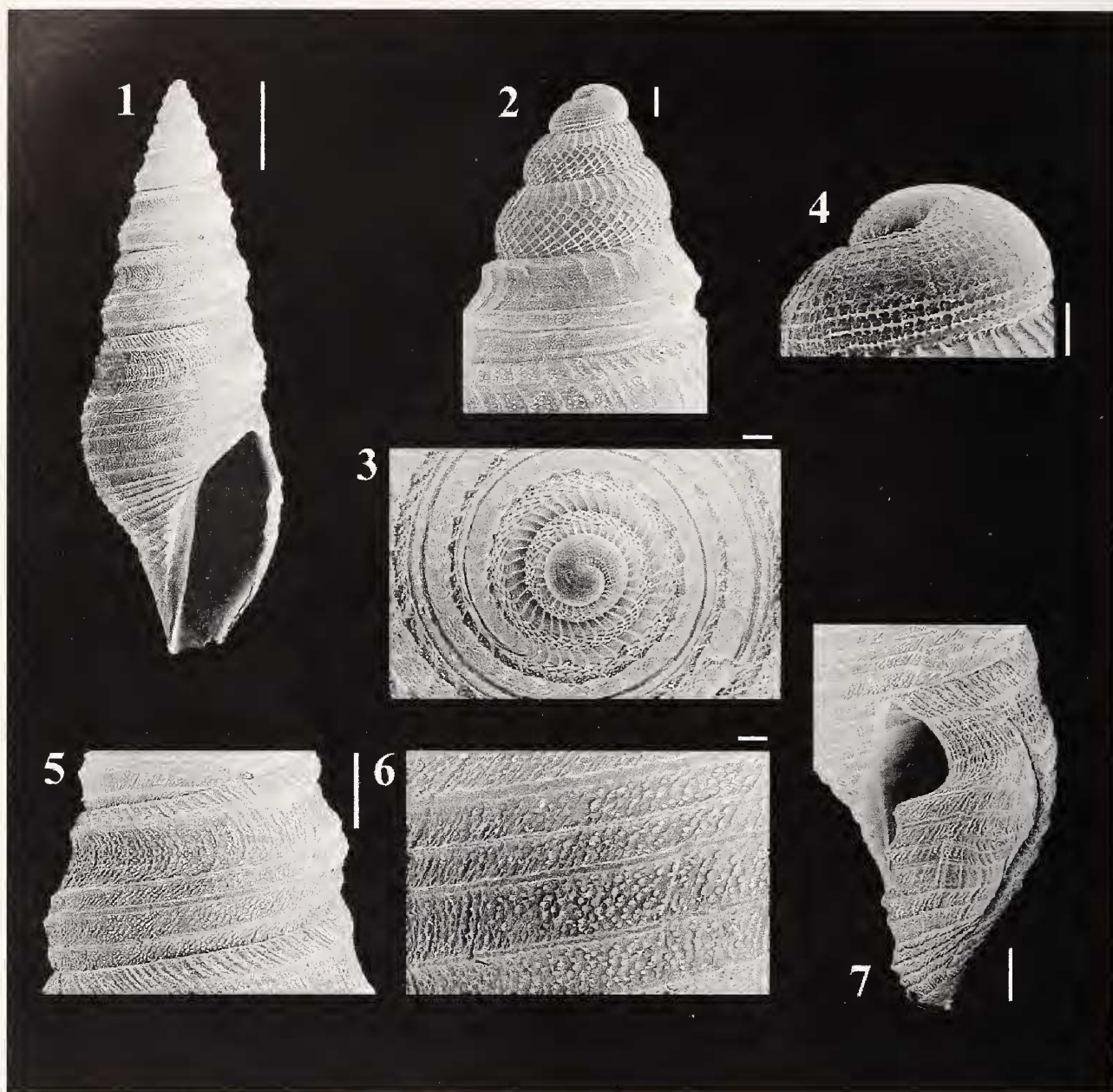
Type material: Holotype and 17 paratypes off Gulf of Aden (RS92/1).

Additional samples of the new species here not considered paratypes occur in other lots of material dredged at the same station (RS92/1).

Type repository: Holotype MZB 42988 and 16 paratypes MZB 42989; 1 paratype NM L6153/T1982.

Etymology: Named after Richard Neil Kilburn (NM) in recognition of his continuous assistance to our work on Turridae s.l.

Remarks: Judging from the available material, *Cryptodaphne kilburni* is the smallest Recent species in the genus and is abundant at station RS92/1. Smaller paratypes have a more biconic shape, lower and slightly more prominent peripheral keel. *Cryptodaphne kilburni* superficially resembles *C. affinis* (Schepman, 1913) but the latter species is larger (9 mm compared to 5.1–6.7 mm in length) and somewhat broader (b/l 0.41 compared to 0.33–0.39), has a wider sutural ramp and two prominent spiral keels just above lower suture. The new species has



Figures 1–7. Holotype of *Cryptodaphne kilburni*, new species (MZB 42988). Figure 1. Apertural view; scale bar = 1 mm. Figures 2–3. Protoconch; scale bar = 100 μ m. Figure 4. Protoconch; scale bar = 50 μ m. Figure 5. Teleoconch whorl; scale bar = 500 μ m. Figure 6. Microsculpture of teleoconch; scale bar = 100 μ m. Figure 7. Anal sinus; scale bar = 500 μ m.

only one weakly projecting peripheral keel which is higher on whorl height. *Cryptodaphne kilburni* is similar to *Cryptodaphne rugosa* Sysoev, 1997, but it is much smaller than the latter (5.1–6.7 mm compared to 7.7–12.8 mm in length) with different sculptural features. The new species has spiral elements, other than the peripheral keel, of relatively uniform strength and lacking secondary threads while *C. rugosa* has spiral cords of primary and secondary magnitude. Furthermore, in *C. rugosa* the col-

umella is markedly twisted; in the new species it is almost straight. Actually, the closest morphological similarity of *Cryptodaphne kilburni* appears to be with the early Miocene *Cryptodaphne pseudodrillia* Powell, 1942. These two species have similar shape, the same dimensions (5.1–6.7 mm and 6 mm in length respectively) and type of anal sinus. However, *C. pseudodrillia* has a strongly projecting peripheral keel at the lower fourth of the whorl (Powell, 1942) while in the Recent species the peripheral

keel is weakly projecting, barely stronger than other cords, and lies at one-third of the whorl height. *Cryptodaphne pseudodrillia* has 1–2 interstitial threads between cords which are absent in the new species. Finally, the protoconch of *C. kilburni* has fewer whorls (3,25 compared to 5).

Powell (1942) referred to the presence of “close-spaced spiral threads producing reticulation” covering the entire shell surface of *C. pseudodrillia* but this statement is presumably erroneous as the threads are axially, not spirally, oriented.

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